Grafting effects on some morpho-physiological characteristics of a cantaloupe landrace (Shahpasand) under salinity and alkalinity stress in hydroponic system

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Abstract

Cantaloupe is one of the most important of vine crops in Iran that today its yield has been decreased due to reduction in the quantity and quality of water resources and also due to increased soil pH because of bicarbonate ion aggregation in the soil. In order to maintain the production quality of this plant, appropriate crop management techniques are needed. For this purpose, to investigate the effect of grafting on some morpho-physiological traits of an Iranian cantaloupe landrace (Shahpasand) under salinity and alkalinity stress conditions, an experiment was conducted as factorial with two factors of stress (control, 15 mM NaCl and 15 mM alkalinity) and grafting (grafted and non-grafted), as a completely randomized design, in nutrient film technique (NFT) hydroponic system. Results showed that interaction effect of stress and grafting was significant on, except rootstock diameter and calcium content, growing parameters, photosynthetic pigments, soluble sugars, proline and mineral elements. Plant height, leaf area, fresh and dry weight of shoots, fresh and dry weight of roots, photosynthetic pigments including chlorophyll *a*, chlorophyll *b*, total chlorophyll and carotenoids, potassium and calcium were decreased by stress. Grafting improved these parameters; but soluble sugars, proline, Na^+ and Cl^- content were increased under the salinity and alkalinity stress. On the basis of this research's results, using grafting in hydroponic system increased and maintained cantaloupe growth characteristics under salinity and alkalinity conditions and the alkalinity stress had more negative effects on the growth of grafted and non-grafted plants than salinity stress.

Keywords: Bicarbonate, Proline, Grafting, NFT system, Chlorophyll.

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